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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/741,434	12/21/2000	Takashi Fukuda	2000_1743A	5280

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EXAMINER

ANGEBRANDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 02/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/741,434	<b>Applicant(s)</b> FUKUDA ET AL.	
	<b>Examiner</b> Martin J Angebrannt	<b>Art Unit</b> 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                            | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____   |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)        | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ | 6) <input type="checkbox"/> Other:  |

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1. The response provided by the applicant has been read and given careful consideration.

Responses to the arguments offered by the applicant are presented after the first rejection to which they are directed.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of Brooks '012 or Champagne '381, combined with Ramannujam et al., "Instant holography", Appl. Phys. Lett., Vol. 74(21) (05/1999).

Brooks '012 teaches the formation of microholograms, which are magnified images of the object recorded. In figures 1, the laser beams is split into the reference (14) and object beams (15). The holographic recording medium (20) in figure 1 records the overlap of the focused object beam with a portion of the reference beam. Clearly, the area covered by the object beam is a subset of that covered by the reference beam. The recording of plural images in the medium and the need to move the medium is disclosed. (3/1-8). The use of photochromic materials as the holographic recording material is disclosed. (2/13-16). The beam is assumed to be split equally into the reference and object beams which intersect at an angle..

Champagne '381 teaches the use of double exposure holograms in defect or stress analysis. The area of the recording medium (64 or 92 in figures 1 and 3) exposed to the object beam (52, 82 & 88) is less than that illuminated by the reference beams (68 and 96). The formation of holograms in sequential areas is disclosed along with the need for development.

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(2/64-68). The focusing of the light from the specularly reflective object allows a shortening of the exposure times due to more efficient light collection. (2/8-43). The beam is assumed to be split equally into the object and reference beams which intersect at an angle.

Ramannujam et al., "Instant holography", Appl. Phys. Lett., Vol. 74(21) (05/1999) teaches that holograms recorded in azobenzenes are instantly viewable after recording. (without the need for development). The use of number average MW of the resulting azo-pendant polyester is 3100. The T<sub>g</sub> is disclosed as 63 degrees C. (page 3227, left column). The resulting gratings are disclosed as having a significant surface relief (page 3227, right column). The relief grating can then be reproduced by molding. The erasure of gratings by heating at 80 degrees C, but are stable at room temperature (page 3228, left column).

It would have been obvious to one skilled in the art to modify the process used by either of Brooks '012 or Champagne '381 with respect to the cited figures by using the azobenzene containing polymeric materials of Ramannujam et al., "Instant holography", Appl. Phys. Lett., Vol. 74(21) (05/1999) to allow erasure and reuse of the recording media to image another object. Further, the photochromic azobenzene materials of Ramannujam et al., "Instant holography", Appl. Phys. Lett., Vol. 74(21) (05/1999) do not require a development process to be visualized/read.

Alternatively, it would have been obvious to one skilled in the art to modify use the media of Ramannujam et al., "Instant holography", Appl. Phys. Lett., Vol. 74(21) (05/1999) to record various holograms which are old and well known in the art as being useful for defect analysis or recording images of minute materials using old and well known methods such as those of either of Brooks '012 or Champagne '381

The applicant argues that the bias beam need not be coherent. The examiner notes that the current scope of the claims and hence the coverage sought does not exclude the beams being coherent. The examiner notes that the formation of interference fringes is disclosed in section [0022] of the instant specification and the formation of diffraction gratings or holograms is disclosed in section [0003] of the instant specification. The examiner also points to the similarity between the apparatus performing the recording in figure 3 of the instant specification and those of the primary references. The applicant could obviate the rejection by excluding the use of coherent light sources or excluding the formation of holograms or gratings through a negative limitation recited in the claim. The applicant also argued double exposure holography in the references. The claims do not preclude recording multiple patterns, even overlapping ones, due to the open claim language used. The "improvement" is conventional in holography and the claims do not exclude holographic processes. The rejection stands.

4. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of Brooks '012 or Champagne '381, combined with Natansohn et al. '381, Bieringer et al. '846, Eich et al. '859 and Savant et al. '221.

Brooks '012 teaches the formation of microholograms, which are magnified images of the object recorded. In figures 1, the laser beams is split into the reference (14) and object beams (15). The holographic recording medium (20) in figure 1 records the overlap of the focused object beam with a portion of the reference beam. Clearly, the area covered by the object beam is a subset of that covered by the reference beam. The recording of plural images in the medium and the need to move the medium is disclosed. (3/1-8). The use of photochromic materials as

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the holographic recording material is disclosed. (2/13-16). The beam is assumed to be split equally into the reference and object beams which intersect at an angle..

Champagne '381 teaches the use of double exposure holograms in defect or stress analysis. The area of the recording medium (64 or 92 in figures 1 and 3) exposed to the object beam (52,82 & 88) is less than that illuminated by the reference beams (68 and 96). The formation of holograms in sequential areas is disclosed along with the need for development. (2/64-68). The focusing of the light from the specularly reflective object allows a shortening of the exposure times due to more efficient light collection. (2/8-43). The beam is assumed to be split equally into the object and reference beams which intersect at an angle.

Natansohn et al. '381 teaches polyesters, polystyrene, polyacrylates, polyurethanes, polyamides and polymethylmethacrylates with photochromic azobenzene moieties incorporated therein. (4/48-5/68). The recording of gratings or holograms is disclosed. (8/3-6 and 8/36-37). These are disclosed as erasable. (8/14+). The examiner holds that the MW is between 1,000 and 1,000,000 based upon the Tg and that it is likely near to 1,000,000.

Bieringer et al. '846 teach various polymeric materials with azomoieties bonded thereto and recording information in them. These are disclosed as having MW of 5,000 to 2,000,000 in lines 34-37 of column 8.

Eich et al. '859 teach various polymeric materials with azomoieties bonded thereto and recording information in them. These are disclosed as having MW of 10,100-47,800 in the table in column 11.

Savant et al. '221 teach various polymeric materials with azomoieties bonded thereto and recording information in them. These include polymers of various MW including as low as

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4,000. The entry for PMMA and other acrylate polymers, specifically includes low, medium and high MW polymers.

It would have been obvious to one of ordinary skill in the art to modify the invention of either of Brooks '012 or Champagne '381, combined with Natansohn et al. '381 by using azobenzene containing polymers with MW of 4,000 to 47,8000 with a reasonable expectation of achieving a recorded image based upon the disclosures of Natansohn et al. '381, Bieringer et al. '846, Eich et al. '859 and Savant et al. '221 demonstrating equivalence which is able to be instantly viewed without the need for development, is stable at room temperature and able to be erased

The applicant argues that the process claimed differs from the holographic processes of the prior art. This is entirely without merit as the specification specifically points to the formation of interference fringes [0022, 0032] and holograms and diffraction gratings [0003]. The secondary references specifically indicate benefits, including erasure and instant viewability. The use of two overlapping coherent light beams (such as from a laser) of the same wavelength will interfere as a matter of the underlying physics of the wave nature of light. The light source (5) shown in figure 3 is a laser, emitting a laser beam [0024] and the use of laser is generally disclosed [0025]. The examiner points out that the apparatus shown in figure 3 is similar to that shown in the figure 1 of Ramannujam et al., "Instant holography", Appl. Phys. Lett., Vol. 74(21) (05/1999) as well as those of Brooks '012 or Champagne '381. The rejection stands.

**The examiner notes that the if the light is an incoherent "continuous-spectrum light source" [0025], then the formation of interference fringes does not occur and the process is indeed non-holographic as argued.**

The rejection stands for the reasons above without further comment.

**5 THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**6** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9309 for regular communications and 703-872-9309 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



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A handwritten signature in black ink, appearing to read 'M. Angebranndt', written in a cursive style.

Martin J. Angebranndt  
Primary Examiner  
Art Unit 1756

January 29, 2004